BASIC AMERICAN FOODS (PWS 6060002) SOURCE WATER ASSESSMENT FINAL REPORT

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State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for the Basic American Foods, Blackfoot, Idaho* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.

The Basic American Foods Public Water System (PWS# 6060002) is classified as a non-community non-transient water system. The drinking water system consists of two well sources, Well #2 and Well #3. The wells serve approximately 650 persons. Both wells are located on the facility's property.

The potential contaminant sources within the delineation capture zones include aboveground storage tank (AST) sites, underground fuel storage tank (UST) sites, dairies, gravel pits, former leaking underground fuel storage tank (LUST) sites, and a wastewater land application (WLAP) site. Also found were sites regulated under the Superfund Amendments and Reauthorization Act (SARA), Resource Conservation Recovery Act (RCRA) and the Toxic Release Inventory (TRI). Additionally, Highway 26, Interstate 15, and a railroad are transportation corridors that cross the delineations. If an accidental spill occurred from any of these potential contaminant sources, inorganic chemical (IOC; i.e. nitrates, arsenic) contaminants, volatile organic chemical (VOC; i.e. petroleum products) contaminants, synthetic organic chemical (SOC; i.e. pesticides) contaminants, or microbial contaminants could be added to the aquifer system. Other sources identified that may contribute to the overall vulnerability of the water source were businesses within the delineated areas that may be considered potential contaminants sources and deep injection wells. Injection wells are regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage. In addition, there is a Group 1 Site (site that show elevated levels of contaminants and are not within the priority one areas) and recharge points (active, proposed, and possible recharge sites on the Snake River Plain). A complete list of potential contaminant sources is provided with this assessment (Appendix A).

For the assessment, a review of laboratory tests was conducted using the Idaho Drinking Water Information Management System (DWIMS) and the State Drinking Water Information System (SDWIS). Total coliform bacteria were detected in the distribution system in July 1997 and August 2000. For Well #2, the IOCs barium, fluoride, and nitrate have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Cyanide was detected in December 1995 at a concentration of 0.044 milligrams per Liter (mg/L). The VOC, tetrachloroethylene was detected in 1993, 1994, and 1995 with concentrations ranging from 0.0014 mg/L per liter to 0.0024 mg/L (MCL is 0.005 mg/L).

The VOC, trichloroethylene was also detected in 1996 at a concentration of 0.0019 mg/L. No SOCs have been detected in the drinking water. For Well #3, the IOCs barium, fluoride, and nitrate have been detected in the drinking water, but at levels below the MCL for each chemical. The VOC, tetrachloroethylene was detected in 1993, 1994, and 1995 with concentrations ranging from 0.0008 mg/L to 0.0021 mg/L. No SOCs have been detected in the drinking water.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. The final susceptibility rankings for both wells automatically scored high for IOCs, VOCs, SOCs, and microbial contaminants because of a road within 50 feet of the wells and the detection of VOC in the finished drinking water.

The capture zones for the wells intersect a priority area for the SOC, atrazine. The organic priority area is areas where greater than 25 % of the wells show levels greater than 1% of the primary standard or other health standards (MCL is 0.003 mg/L for atrazine). Atrazine is a widely used herbicide for control of broadleaf and grassy weeds.

This assessment should be used as a basis for determining appropriate new protection measures or reevaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the Basic American Foods, drinking water protection activities should focus on identifying the source of tetrachloroethylene and trichloroethylene in the drinking water. The system should also continue efforts aimed at keeping the distribution system free of microbial contaminants that may affect the drinking water quality. If tetrachloroethylene or trichloroethylene concentrations approach or exceed the MCL, the system should take appropriate measures to treat the water source. Treatments such as granular activated charcoal and packed tower aeration for VOC contaminants should be investigated to remedy these problems. In addition, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). The wells should maintain sanitary standards regarding wellhead protection. Also, any new sources that could be considered potential contaminant sources in the wells' zones of contribution should also be investigated and monitored to prevent future contamination. No potential contaminants (pesticides, paint, fuel, cleaning supplies, etc.) should be stored or applied within 50 feet of the wells. Land uses within most of the source water assessment area are outside the direct jurisdiction of the Basic American Foods. Therefore partnerships with state and local agencies, industrial and commercial groups should be established to ensure future land uses are protective of ground water quality. Educating employees about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods, proper lawn and garden care and the importance of water conservation to name but a few. There are multiple resources available to help water systems implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Bingham County Soil and Water Conservation District. As major transportation corridors intersect the delineations (such as Highway 26 and Interstate 15), the Idaho Department of Transportation should be involved in protection efforts.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR BASIC AMERICAN FOODS, BLACKFOOT, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. It is important to review this information to understand what the ranking of this source means. A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are contained in this report. The list of significant potential contaminant source categories and their rankings used to develop this assessment is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.

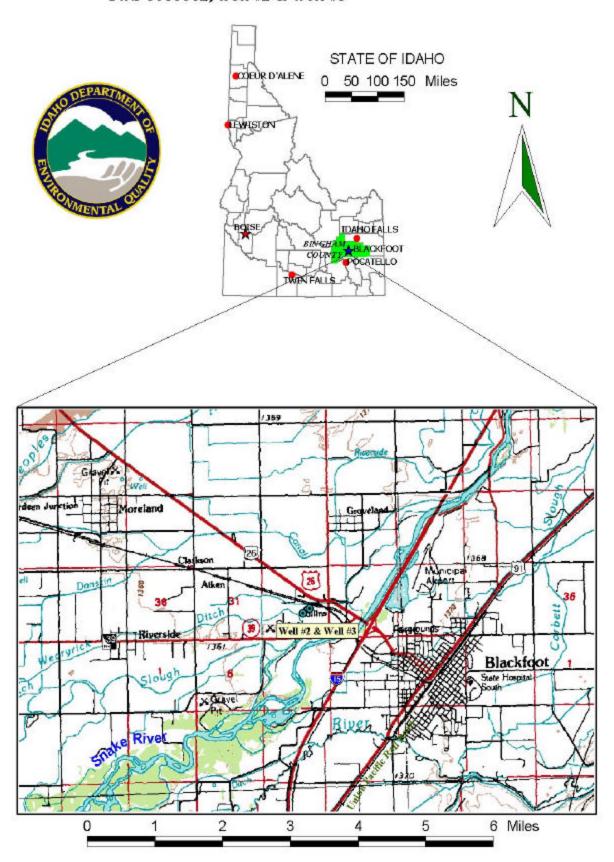
The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Basic American Foods is a non-community non-transient public drinking water system located in Bingham County (Figure 1). The drinking water system consists of two well sources, Well #2 and Well #3. The wells serve approximately 650 persons. Both wells are located on the facility's property.

FIGURE 1 - Geographic Location of Basic American Foods, PWS 6060002, Well #2 & Well #3



Total coliform bacteria were detected in the distribution system in July 1997 and August 2000. For Well #2, the inorganic chemicals (IOCs) barium, fluoride, and nitrate have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Cyanide was detected in December 1995 at a concentration of 0.044 milligrams per Liter (mg/L). The volatile organic chemical (VOC) tetrachloroethylene was detected in 1993, 1994, and 1995 with concentrations ranging from 0.0014 mg/L per liter to 0.0024 mg/L (MCL is 0.005 mg/L). The VOC, trichloroethylene was also detected in 1996 at a concentration of 0.0019 mg/L. No synthetic organic chemicals (SOCs) have been detected in the drinking water. For Well #3, the IOCs barium, fluoride, and nitrate have been detected in the drinking water, but at levels below the MCL for each chemical. The VOC tetrachloroethylene was detected in 1993, 1994, and 1995 with concentrations ranging from 0.0008 mg/L to 0.0021 mg/L. No SOCs have been detected in the drinking water.

Defining the Zones of Contribution--Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a pumping well) for water in the aquifer. Washington Group International (WGI) was contracted by DEQ to define the public water system's zones of contribution. WGI used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) Time-of-Travel (TOT) for water associated with the East Margin Area of the Eastern Snake River Plain (ESRP) hydrologic province in the vicinity of the Basic American Foods. The computer model used site specific data, assimilated by WGI from a variety of sources including operator records well logs and hydrogeologic reports. A summary of the hydrogeologic information from the WGI is provided below.

Hydrogeologic Conceptual Model

The East Margin Area encompasses 821 square miles, representing approximately 8 percent of the total area of the ESRP hydrologic province. The majority of the East Margin Area is within Bingham County, with small areas occurring in Bannock, Bonneville, and Power counties.

The regional ESRP aquifer is the most significant aquifer in the East Margin Area and consists primarily of basalt of the Quaternary-aged Snake River Group. However, additional water-bearing units are used for water supply along the margin of the ESRP. In order of decreasing age, the most significant aquifers in the Michaud Flats area are bedded rhyolite (volcanic rock) of the Tertiary-aged Starlight Formation and Quaternary-aged gravels of a low relief plain formed by running water (pediment), basalt of the Big Hole Formation, and stream deposits of the Sunbeam Formation (see Jacobson, 1982, p. 7, and Corbett, et al., 1980, pp. 6-10). A few shallow domestic wells in the central Michaud Flats area also are completed in Michaud Gravel, which is the shallow water-table aquifer. The American Falls Lake Beds Formation (AFLB) confines the deeper aquifers and averages 80 feet in thickness in the central Michaud Flats area (Jacobson, 1984, p. 6). The AFLB pinches out in the eastern Michaud Flats area near the Portneuf River, effectively combining the shallow and deep stream deposits into a single water table aquifer (Bechtel, 1994, p. 2-2). Other aquifers in the East Margin Area include fractured quartzite that has been developed near Blackfoot, stream deposits near the cities of Firth and Basalt, and pediment gravels in the Gibson Terrace area near Tyhee and Chubbuck.

PWS wells in the East Margin Area of the ESRP province produce water from five different aquifers: the Regional Eastern Snake River Plain aquifer, three alluvial (or stream deposited) aquifers (Eastern Michaud Flats, Firth/Basalt, and Gibson Terrace/Pocatello Bench) and a quartzite aquifer (Blackfoot).

The Regional Eastern Snake River Plain Aquifer, the water source for the Basic American Foods, is described in detail below.

Regional Eastern Snake River Plain Aquifer

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are primarily filled with highly fractured layered Quaternary-aged basalt flows of the Snake River Group, which are between (intercalated) layers of rocks formed by sediment deposition (sedimentary) along the margins (Garabedian, 1992, p. 5). Quaternary-aged basalts are estimated to be 100 to 1,500 feet thick, with the majority of the area in the range of 100 to 500 feet thick (Whitehead, 1992, Plate 3). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and streamproduced sediments overlies the basalt. The plain is bounded on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. These rocks may also underlie the plain (Garabedian, 1992, p. 5). Granite of the Idaho batholith borders the plain to the northwest, along with sedimentary rocks and rocks changed by heat and/or pressure (metamorphic) (Cosgrove et al., 1999, p. 10). The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. A high degree of connectivity with the regional aquifer system is displayed over much of the river as it passes through the plain. However, some reaches are believed to be perched or separated from the main ground water by unsaturated rock, such as the Lewisville-to-Shelly reach. Rivers and streams entering the plain from the south are tributary to the Snake River. With the exception of the Big and Little Wood rivers, rivers entering from the north vanish into the basalts of the Snake River Plain aquifer that have a higher ability to transmit water.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) and Lindholm (1996, p.1) report that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Transmissivities obtained from test data in the upper 100 to 200 feet of the aquifer range from less than 0.1 square feet per second (ft²/sec) to 56 ft²/sec (1.0x10⁴ to 4.8x10⁶ ft²/day; Garabedian, 1992, p. 11, and Lindholm, 1996, p. 18). Lindholm (1996, p. 18) estimates aquifer thickness to range from 100 feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et al., 1999, p.15).

Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 ft/mile and average 12 ft/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations. The estimated effective ratio of the rock's open space volume to its total volume range from 0.04 to more than 0.25 (Ackerman, 1995, p.1, and Lindholm, 1996, p.16).

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11) and locally from canal leakage. Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

Aquifer discharge occurs primarily as seeps and springs on the northern wall of the Snake River canyon near Thousand Springs and near American Falls and Blackfoot (Garabedian, 1992, p.17). To a lesser degree, discharge also occurs through pumping and underflow.

The East Margin Area is among the most transmissive regions of the regional aquifer, therefore it has a higher ability to transmit water. A transmissivity of 21 ft²/sec was used to represent the upper 200 feet of the regional aquifer in the East Margin Area in the three-dimensional USGS ground water flow model (Garabedian, 1992, Plate 6). The equivalent hydraulic conductivity or the rate at which water can move through permeable material is 9,072 feet per day (ft/day). This value is consistent with the range of hydraulic conductivity (9,500 to 11,708 ft/day) calculated using data from a constant-rate aquifer test conducted in 1981 (Jacobson, 1982, p. 23). This range was calculated by dividing the estimated transmissivity (228,000 to 281,000 ft²/day) by the perforated interval of the observation well (24 feet). The geometric mean hydraulic conductivity based on analysis of specific capacity data from PWS wells (135 ft/day) is significantly lower.

A published water table map of the Upper Snake River Basin (IDWR, 1997, p. 9) indicates that the ground water flow direction in the ESRP aquifer in the East Margin Area is similar to that depicted at the regional scale (e.g., Garabedian, 1992, Plate 4).

Recharge from precipitation and surface water irrigation in the East Margin Area ranges from less than 10 to more than 20 inches per year (Garabedian,1992, Plate 8). The low end of the range applies to the area near Blackfoot, while the high end applies to the area on the west side of American Falls Reservoir near Aberdeen.

Kjelstrom (1995, p. 13) reports an annual river loss of 280,000 acre-feet to the regional basalt aquifer for the 27.5-mile Lewisville-to-Shelley reach of the Snake River and 110,000 acre-feet for the 23.5-mile Shelley-to-Blackfoot reach. Annual river gains of 1,900,000 acre-feet for the 36.6-mile Blackfoot-to-Neeley reach are also estimated (Kjelstrom,1995, p. 13). A seepage study conducted in the fall of 1980 on the Portneuf River showed a gain of about 560 cubic feet per second (ft³/sec) (405,691 acre-feet) for the 13-mile Pocatello-to-American Falls Reservoir reach (Jacobson, 1982, p. 16). The average flow in the Blackfoot River near the city of Blackfoot at Station #13068500 (5.2 ft³/sec; USGS, 2001) compared to the flow in the Snake River near the city of Blackfoot at Station #13069500 (2,900 ft³/sec; USGS, 2001).

The water producing zones for the Basic American Foods wells are from the regional basalt aquifer. The delineated source water assessment area for the Basic American Foods wells trend in a northeast direction and is elongated and conical in shape. The length of the delineation extends approximately 28 miles and extends into the City of Idaho Falls. In this case the Snake River is considered the primary input of water to the aquifer, and therefore, the delineation does not cross under the Snake River. The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levelsthat could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases identified potential contaminant sources within the delineation areas. Some of these sources include aboveground storage tank (AST) sites, underground fuel storage tank (UST) sites, dairies, gravel pits, former leaking underground fuel storage tank (LUST) sites, and a wastewater land application (WLAP) site.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the <u>potential</u> for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the Basic American Foods water system was conducted in the Summer of 2002. The first phase involved identifying and documenting potential contaminant sources within the Basic American Foods source water assessment area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. Then DEQ conducted the second phase or enhanced inventory to validate the sources identified in phase one and to identify additional potential sources of contamination in the delineated source water assessment area. This task was undertaken with the assistance of Ms. Cindy Slomkowski. At the time of the enhanced inventory no additional potential contaminant sources were found within the delineated source water area. Maps with well locations, delineated areas, and potential contaminant sources are provided with this report. Each potential contaminant source has been given a unique number that references tabular information associated with each public water well (Appendix A).

Section 3. Susceptibility Analyses

The susceptibility of the wells to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the wells, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for the wells is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix B contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors. These factors are surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the water producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet from the surface protect the ground water from contamination.

Hydrologic sensitivity was rated high for both wells (Table 1). This is based upon moderate to well drained soil classes, within the delineated area, defined by the National Resource Conservation Service (NRCS). Soils that have poor to moderate drainage characteristics have better filtration capabilities than faster draining soils. For Well #2, there was insufficient well log information to evaluate the vadose zone composition, the first depth to ground water, and whether there is at least 50 feet of cumulative thickness of low permeability material that could reduce the downward movement of contaminants. Well #3 is also potentially sensitive due to its vadose compositions consisting mostly of fractured rock. The depth to first ground water is less than 300 feet from the surface. In addition, the well lacks a 50 feet cumulative thickness of low permeability material.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system that can better protect the water. If the casing and annular seal both extend into a low permeability unit then the possibility of cross contamination from other aquifer layers is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capabilities. When information was adequate, a determination was made as to whether the casing and annular seals extend into low permeability units and whether current public water system (PWS) construction standards are met.

The system construction scores rated moderate for both wells. The sanitary survey (conducted by the Southeastern District Health Department) states there are no well vents on the wellheads. The purpose of the vent is to vent the space between the casing and the column and prevent a vacuum from forming when the well turns on and draws down the water table. A vacuum could draw in contamination through joints or leaks in the casing or cause the well to slough. The sanitary survey also states the surface seals are in good condition.

No well log information was available for Well #2 to determine whether the well casing and annular seal extend into a low permeable geologic formation, two important aspects of proper well construction. The well casing height is adequate and the well is located outside a 100-year floodplain, which may decrease the chance of contaminants being drawn into the drinking water source by surface water flooding.

For Well #3 the well log indicates the well is completed to a depth of 155 feet below ground surface (bgs) into red cinders. There was insufficient well log information to determine the depth of the annular seal. The well casing extends to a depth of 128 feet into lava rock. The static water level was recorded at 38 feet bgs in 1962 and the highest production unit occurs at least 100 feet below the static water level. The well casing height is adequate and the well is located outside of a 100-year floodplain, decreasing the chance of contaminants being drawn into the drinking water source by surface water flooding.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules* (1993) require all public water systems to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead and if the well is designed to yield greater than 50 gallons per minute (gpm) a minimum of a 6-hour pump test is required. These standards are used to rate the system construction for the well by evaluating items such as condition of wellhead and surface seal, whether the casing and annular space is within consolidated material or 18 feet below the surface, the thickness of the casing, etc. If all criteria are not met, the public water source does not meet the IDWR Well Construction Standards. In this case, there was insufficient information available to determine if the wells meets all the criteria outlined in the IDWR Well Construction Standards.

Potential Contaminant Source and Land Use

The potential contaminant sources and land use within the delineated zones of water contribution are assessed to determine the well's susceptibility. When agriculture is the predominant land use in the area, this may increase the likelihood of agricultural wastewater infiltrating the ground water system. Agricultural land is counted as a source of leachable contaminants and points are assigned to this rating based on the percentage of agricultural land. The predominant land use within the delineated capture zones of the Basic American Foods is irrigated agricultural land.

In terms of potential contaminant sources and land use susceptibility the ratings are as follows. The wells rated high for IOCs (i.e., nitrates), VOCs (i.e. petroleum related products), and SOCs (i.e., pesticides) and moderate for microbial contaminants (i.e., fecal coliform).

Most of the potential contaminant sources fall within the 6-10 year TOT zones. However, there are sufficient sources within the 0-3 year TOT to raise the land use scores. These sources include underground fuel storage tanks, dairies, and former leaking underground storage tanks. The locations of potential contaminant sources and delineated TOT zones for the wells are shown on Figure 2.

Final Susceptibility Rating

A detection above a drinking water standard (MCL), any detection of a VOC or SOC, or having potential contaminant sources within 50 feet of the wellhead will automatically give a high susceptibility rating to the final well ranking despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and a large percentage of agricultural land contribute greatly to the overall ranking.

Table 1. Summary of Basic American Foods Susceptibility Evaluation

Drinking	Susceptibility Scores					ility Scores				
Water Sources	Hydrologic Sensitivity	S			System Construction	Final Susceptibility Ranking				
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #2	Н	Н	Н	Н	M	Н	H*	H*	H*	H*
Well #3	Н	Н	Н	Н	M	M	H*	H*	H*	H*

H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical; $H^* = Indicates source automatically scored high susceptibility due to the detection of <math>VOC$ in the finished drinking water and wells are located in close proximity of road.

Susceptibility Summary

The final susceptibility rankings for the wells were automatically high for IOC, VOC, SOC, and microbial contaminants. These ratings reflect the hydrologic sensitivity, system construction, and potential contaminants inventory and land use within the delineated source water assessment areas for the wells, as well as the proximity to a road and the detections of VOCs.

For Well #2, the IOCs barium, fluoride, and nitrate have been detected in the drinking water, but at levels below the MCL for each chemical. Cyanide was detected in December 1995 at a concentration of 0.044 mg/L. The VOCs, tetrachloroethylene was detected in 1993, 1994, and 1995 with concentrations ranging from 0.0014 mg/L per liter to 0.0024 mg/L (MCL is 0.005 mg/L). The VOC trichloroethylene was also detected in 1996 at a concentration of 0.0019 mg/L. No SOCs have been detected in the drinking water. For Well #3, the IOCs barium, fluoride, and nitrate have been detected in the drinking water, but at levels below the MCL for each chemical. The VOC tetrachloroethylene was detected in 1993, 1994, and 1995 with concentrations ranging from 0.0008 micrograms per liter to 0.0021 mg/L. No SOCs have been detected in the drinking water.

The county level agriculture-chemical use is considered high in this area due to the significant amount of agricultural land. Although there may only be a small portion of agriculture land in the direct vicinity of the well, it is useful as a tool in determining the overall chemical usage such as pesticides and how it may impact ground water through infiltration and surface water runoff. In addition, there were potential sources of contamination found within the wells' delineated TOT zones (Figure 2).

Section 4. Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or reevaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the Basic American Foods, drinking water protection activities should focus on identifying the source of tetrachloroethylene and trichloroethylene in the drinking water. The system should also continue efforts aimed at keeping the distribution system free of microbial contaminants that may affect the drinking water quality. If tetrachloroethylene or trichloroethylene concentrations approach or exceed the MCL, the system should take appropriate measures to treat the water source. Treatments such as granular activated charcoal and packed tower aeration for VOC contaminants should be investigated to remedy these problems. In addition, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey. The wells should maintain sanitary standards regarding wellhead protection. Also, any new sources that could be considered potential contaminant sources in the wells' zones of contribution should also be investigated and monitored to prevent future contamination. No potential contaminants (pesticides, paint, fuel, cleaning supplies, roads, etc.) should be stored or applied within 50 feet of the wells. Land uses within most of the source water assessment area are outside the direct jurisdiction of the Basic American Foods. Therefore partnerships with state and local agencies, industrial and commercial groups should be established to ensure future land uses are protective of ground water quality. Educating employees and the public about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods and the importance of water conservation to name but a few. There are multiple resources available to help water systems implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Bingham County Soil and Water Conservation District. Any major transportation corridors that intersect the delineation (such as Highway 91/26 and Highway 20), the Idaho Department of Transportation should be involved in protection efforts.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

DEQ Pocatello Regional Office (208) 236-6160

DEQ State Office (208) 373-0502

Website: http://www.deq.state.id.usq

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mlharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

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POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

<u>AST (Aboveground Storage Tanks)</u> – Sites with aboveground storage tanks

<u>Business Mailing List</u> – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

<u>CERCLIS</u> – This includes sites considered for listing under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

<u>Cyanide Site</u> – DEQ permitted and known historical sites/facilities using cyanide.

<u>Dairy</u> – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

<u>Deep Injection Well</u> – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

<u>Floodplain</u> – This is a coverage of the 100-year floodplains.

<u>Group 1 Sites</u> – These are sites that show elevated levels of contaminants and are not within the priority one areas.

<u>Inorganic Priority Area</u> – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

<u>Landfill</u> – Areas of open and closed municipal and non-municipal landfills.

<u>LUST (Leaking Underground Storage Tank)</u> – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

<u>Mines and Quarries</u> – Mines and quarries permitted through the Idaho Department of Lands.)

<u>Nitrate Priority Area</u> – Area where greater than 25% of wells/springs show nitrate values above 5 mg/l.

NPDES (National Pollutant Discharge Elimination
System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

<u>Organic Priority Areas</u> – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRA – Site regulated under Resource Conservation
Recovery Act (RCRA). RCRA is commonly associated with
the cradle to grave management approach for generation,
storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and

<u>Reauthorization Act Tier II Facilities</u>) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

<u>Toxic Release Inventory (TRI)</u> – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

<u>UST (Underground Storage Tank)</u> – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

<u>Wastewater Land Applications Sites</u> – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

<u>Wellheads</u> – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Appendix A

Basic American Foods Potential Contaminant Sources

Table 2. Potential Contaminants

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Site #	Source Description	TOT Zone	Source	Potential
Энс п	Source Description	(in years)	of Information	Contaminants
47	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
48	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC
49	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
50	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
51	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
52	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
53	UST Site-Utilities; Closed	6-10	Database Search	VOC, SOC
54	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
55	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
56	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
57	UST Site-Other; Closed	6-10	Database Search	VOC, SOC
58	UST Site-Contractor; Open	6-10	Database Search	VOC, SOC
59	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
60	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
61	UST Site-Local Government; Closed	6-10	Database Search	VOC, SOC
62	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
63	UST Site-Truck/Transporter; Open	6-10	Database Search	VOC, SOC
64	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
65	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
66	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
67	UST Site-Other; Closed	6-10	Database Search	VOC, SOC
68	UST Site-Local Government; Open	6-10	Database Search	VOC, SOC
69	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC
70	UST Site-Utilities; Closed	6-10	Database Search	VOC, SOC
71	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
72	UST Site-State Government; Closed	6-10	Database Search	VOC, SOC
73	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
74	UST Site-Auto Dealership; Closed	6-10	Database Search	VOC, SOC
75	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
76	UST Site-Not Listed; Open	6-10	Database Search	VOC, SOC
77	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
78	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
79	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
80	UST Site-Not Listed; Closed	6-10	Database Search	VOC, SOC
81	UST Site-Other; Closed	6-10	Database Search	VOC, SOC
82	UST Site-Other; Closed	6-10	Database Search	VOC, SOC
83	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
84	UST Site-Commercial; Closed	6-10	Database Search	VOC, SOC
85	UST Site-Gas Station; Open	6-10	Database Search	VOC, SOC
86	UST Site-Truck/Transporter; Open	6-10	Database Search	VOC, SOC
87	UST Site-Gas Station; Closed	6-10	Database Search	VOC, SOC
88	Dairy	6-10	Database Search	IOC
89	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
90	Automobile Repairing & Service	6-10	Database Search	IOC, VOC, SOC
91	Hydraulic Equipment-Repairing	6-10	Database Search	VOC, SOC
92	Aircraft Servicing & Maintenance	6-10	Database Search	IOC, VOC, SOC

Site #	Source Description	TOT Zone	Source	Potential
		(in years)	of Information	Contaminants
93	Veterinarians	6-10	Database Search	IOC, VOC
94	Concrete Contractors	6-10	Database Search	IOC, VOC, SOC
95	Boat Dealers	6-10	Database Search	VOC, SOC
96	Steel Fabricators	6-10	Database Search	IOC, VOC
97	Oils-Fuel (Wholesale)	6-10	Database Search	VOC, SOC
98	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
99	Automobile Electric Service	6-10	Database Search	IOC, VOC, SOC
100	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
101	Automobile Dealers-New Cars	6-10	Database Search	VOC, SOC
102	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
103	Industrial Machinery/Equipment	6-10	Database Search	VOC, SOC
104	Tree Service	6-10	Database Search	VOC, SOC
105	Garbage Collection	6-10	Database Search	IOC, VOC, SOC
106	Garbage Collection	6-10	Database Search	IOC, VOC, SOC
107	Property Maintenance	6-10	Database Search	IOC, SOC
108	Boxes-Folding-Manufacturers	6-10	Database Search	VOC
109	Grinding Wheels (Manufacturers)	6-10	Database Search	IOC, VOC
110	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
111	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
112	Automobile Lubrication Service	6-10	Database Search	IOC, VOC, SOC
113	Automobile Dealers-New Cars	6-10	Database Search	VOC, SOC
114	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
115	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
116	Concrete Contractors	6-10	Database Search	IOC, VOC, SOC
117	Bus Lines	6-10	Database Search	VOC, SOC
118	Textile Bags (Manufacturers)	6-10	Database Search	VOC
119	Oils-Fuel (Wholesale)	6-10	Database Search	VOC, SOC
120	Controls Systems/Regulators	6-10	Database Search	IOC, VOC, SOC
121	Cleaners	6-10	Database Search	VOC
122	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
123	Metal Fabricators	6-10	Database Search	IOC, VOC
124	Truck-Dealers-Used	6-10	Database Search	VOC, SOC
125	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
126	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
127	Coatings-Protective (Manufacturers)	6-10	Database Search	VOC
128	Painters	6-10	Database Search	VOC
129	Electric Motors-Dlrs/Repairing	6-10	Database Search	IOC, VOC
130	Hardware-Retail	6-10	Database Search	IOC, VOC, SOC
131	Automobile Repairing & Service	6-10	Database Search	IOC, VOC, SOC
132	Aircraft Servicing & Maintenance	6-10	Database Search	IOC, VOC, SOC
133	Movers	6-10	Database Search	VOC, SOC
134	Grain-Dealers (Wholesale)	6-10	Database Search	IOC
135	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
136	Paving Contractors	6-10	Database Search	VOC, SOC
137	Engines-Diesel (Wholesale)	6-10	Database Search	VOC, SOC
138	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC

Site #	Source Description	TOT Zone	Source	Potential
	_	(in years)	of Information	Contaminants
139	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
140	Oils-Fuel (Wholesale)	6-10	Database Search	VOC, SOC
141	Service Industry Machinery	6-10	Database Search	VOC, SOC
142	Painters	6-10	Database Search	VOC
143	Trucking-Motor Freight	6-10	Database Search	VOC, SOC
144	Automobile Body-Repairing &	6-10	Database Search	IOC, VOC, SOC
145	Animal Shelters	6-10	Database Search	IOC
146	Boat Dealers	6-10	Database Search	VOC, SOC
147	Automobile Parts & Supplies-Retail	6-10	Database Search	VOC, SOC
148	Automobile Customizing	6-10	Database Search	IOC, VOC, SOC
149	Tools-Electric (Wholesale)	6-10	Database Search	IOC, VOC
150	Gas Companies	6-10	Database Search	VOC, SOC
151	Demolition Contractors	6-10	Database Search	IOC, VOC, SOC
152	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC
153	Automobile Repairing & Service	6-10	Database Search	IOC, VOC, SOC
154	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
155	Automobile Parts & Supplies-Retail	6-10	Database Search	VOC, SOC
156	Campgrounds	6-10	Database Search	IOC, VOC, SOC
157	Asphalt & Asphalt Products	6-10	Database Search	IOC, VOC, SOC
158	Truck-Repairing & Service	6-10	Database Search	IOC, VOC, SOC
159	Movers	6-10	Database Search	VOC, SOC
160	House & Building Movers	6-10	Database Search	VOC, SOC
161	Wrecker Service	6-10	Database Search	IOC, VOC, SOC
162	Veterinarians	6-10	Database Search	IOC, VOC
163	Painters	6-10	Database Search	VOC
164	Trailers-Horse (Wholesale)	6-10	Database Search	VOC, SOC
165	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
166	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
167	Movers	6-10	Database Search	VOC, SOC
168	X-Ray Laboratories-Industrial	6-10	Database Search	IOC, VOC, SOC
169	Photographers-Portrait	6-10	Database Search	VOC
170	Building Contractors	6-10	Database Search	IOC, VOC, SOC
171	Automobile Parts & Supplies-Retail	6-10	Database Search	VOC, SOC
172	Carpet & Rug Cleaners	6-10	Database Search	VOC
173	Electric Equipment & Supplies-	6-10	Database Search	IOC, VOC
174	Photographers-Portrait	6-10	Database Search	VOC
175	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
176	Laboratories-Dental	6-10	Database Search	IOC, VOC, SOC
177	Lawn Mowers	6-10	Database Search	VOC, SOC
178	Laboratories-Testing	6-10	Database Search	IOC, VOC, SOC
179	Aircraft Charter Rental & Leasing	6-10	Database Search	VOC, SOC
180	Dairies	6-10	Database Search	IOC
181	Automobile Renting & Leasing	6-10	Database Search	VOC, SOC
182	Movers	6-10	Database Search	VOC, SOC
183	Hardware-Retail	6-10	Database Search	IOC, VOC, SOC
184	Plumbing Drain & Sewer Cleaning	6-10	Database Search	IOC, VOC

Site #	Source Description	TOT Zone	Source	Potential
		(in years)	of Information	Contaminants
185	Truck-Repairing & Service	6-10	Database Search	IOC, VOC, SOC
186	Truck Renting & Leasing	6-10	Database Search	VOC, SOC
187	Excavating Contractors	6-10	Database Search	IOC, VOC, SOC
188	Contractors-	6-10	Database Search	IOC, VOC, SOC
189	Screen Printing	6-10	Database Search	VOC
190	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC
191	Veterinarians	6-10	Database Search	IOC, VOC
192	Car Washing & Polishing	6-10	Database Search	IOC, VOC, SOC
193	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC
194	Automobile-Antique & Classic	6-10	Database Search	VOC, SOC
195	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
196	Government-Forestry Services	6-10	Database Search	VOC, SOC
197	Cleaners	6-10	Database Search	VOC
198	Landscape Contractors	6-10	Database Search	IOC, VOC, SOC
199	Delivery Service	6-10	Database Search	VOC, SOC
200	Buses-Charter & Rental	6-10	Database Search	VOC, SOC
201	Tree Service	6-10	Database Search	VOC, SOC
202	Automobile Repairing & Service	6-10	Database Search	IOC, VOC, SOC
203	State Government-Transportation	6-10	Database Search	VOC, SOC
204	Pile Driving Equipment	6-10	Database Search	VOC, SOC
205	Truck Renting & Leasing	6-10	Database Search	VOC, SOC
206	Federal Government-National Security	6-10	Database Search	VOC, SOC
207	Truck-Repairing & Service	6-10	Database Search	IOC, VOC, SOC
208	Excavating Contractors	6-10	Database Search	IOC, VOC, SOC
209	Machine Shops	6-10	Database Search	IOC, VOC, SOC
210	Disinfectants & Germicides	6-10	Database Search	IOC, VOC, SOC
211	Transmissions-Automobile	6-10	Database Search	IOC, VOC, SOC
212	Trucking-Heavy Hauling	6-10	Database Search	VOC, SOC
213	Service Stations-Gasoline & Oil	6-10	Database Search	VOC, SOC
214	Automobile Dealers-Used Cars	6-10	Database Search	VOC, SOC
215	Welding Equipment & Supplies	6-10	Database Search	IOC, VOC
216	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC
217	Metalworking Machinery	6-10	Database Search	IOC, VOC
218	Snowmobiles	6-10	Database Search	VOC, SOC
219	Tree Service	6-10	Database Search	VOC, SOC
220	Leather Gloves & Mittens	6-10	Database Search	VOC
221	Truck Stops	6-10	Database Search	VOC, SOC
222	Toxic Release Inventory	6-10	Database Search	VOC, SOC
223	RCRA Site	6-10	Database Search	SOC
224	RCRA Site	6-10	Database Search	IOC, VOC, SOC
225	RCRA Site	6-10	Database Search	IOC, VOC, SOC
226	RCRA Site	6-10	Database Search	IOC, VOC, SOC
227	RCRA Site	6-10	Database Search	VOC, SOC
228	RCRA Site	6-10	Database Search	IOC, VOC, SOC
229	RCRA Site	6-10	Database Search	VOC, SOC

Site#	Source Description	TOT Zone	Source	Potential
		(in years)	of Information	Contaminants
230	RCRA Site	6-10	Database Search	IOC, VOC, SOC
231	RCRA Site	6-10	Database Search	IOC, VOC, SOC
232	RCRA Site	6-10	Database Search	VOC, SOC
233	RCRA Site	6-10	Database Search	IOC, VOC, SOC
234	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
235	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
236	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
237	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
238	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
239	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
240	Mine/Quarry	6-10	Database Search	IOC, VOC, SOC
241	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
242	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
243	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
244	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
245	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
246	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
247	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
248	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
249	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
250	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
251	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
252	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
253	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
254	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
255	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
256	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
257	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
258	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
259	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
260	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
261	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
262	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
263	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
264	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
265	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
266	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
267	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
268	Deep Injection Well	6-10	Database Search	IOC, VOC, SOC
269	SARA Site	6-10	Database Search	IOC, VOC, SOC
270	SARA Site	6-10	Database Search	IOC, VOC, SOC
271	SARA Site	6-10	Database Search	IOC, VOC, SOC
272	SARA Site	6-10	Database Search	VOC, SOC
273	SARA Site	6-10	Database Search	VOC, SOC
274	SARA Site	6-10	Database Search	VOC, SOC
275	SARA Site	6-10	Database Search	VOC, SOC
276	SARA Site	6-10	Database Search	IOC, VOC, SOC

Site #	Source Description	TOT Zone	Source	Potential
		(in years)	of Information	Contaminants
277	SARA Site	6-10	Database Search	IOC, VOC, SOC
278	SARA Site	6-10	Database Search	VOC, SOC
279	SARA Site	6-10	Database Search	VOC, SOC
280	SARA Site	6-10	Database Search	VOC, SOC
281	SARA Site	6-10	Database Search	IOC, VOC, SOC
282	SARA Site	6-10	Database Search	IOC, VOC, SOC
283	SARA Site	6-10	Database Search	IOC, VOC, SOC
284	SARA Site	6-10	Database Search	VOC, SOC
285	SARA Site	6-10	Database Search	IOC, VOC, SOC
286	SARA Site	6-10	Database Search	IOC
287	SARA Site	6-10	Database Search	IOC, VOC, SOC
288	Recharge Point	6-10	Database Search	IOC, VOC, SOC
289	Recharge Point	6-10	Database Search	IOC, VOC, SOC
290	Recharge Point	6-10	Database Search	IOC, VOC, SOC
291	Recharge Point	6-10	Database Search	IOC, VOC, SOC
292	Recharge Point	6-10	Database Search	IOC, VOC, SOC
293	Recharge Point	6-10	Database Search	IOC, VOC, SOC
294	Recharge Point	6-10	Database Search	IOC, VOC, SOC
295	Recharge Point	6-10	Database Search	IOC, VOC, SOC
296	AST Site	6-10	Database Search	VOC, SOC
297	AST Site	6-10	Database Search	VOC, SOC
298	AST Site	6-10	Database Search	VOC, SOC
	Railroad	0-3	GIS Map	IOC, VOC, SOC Microbials
	Highway 26	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Interstate 15	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Springfield Canal	0-3	GIS Map	IOC, VOC, SOC, Microbials
	New Lava Side Ditch	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Interstate 15	3-6; 6-10	GIS Map	IOC, VOC, SOC
	Highway 20	6-10	GIS Map	IOC, VOC, SOC

¹ SARA = Superfund Amendments and Reauthorization Act, RCRA = Resource Conservation Recovery Act,

TRI = Toxic Release Inventory, UST = underground storage tank, LUST = leaking underground storage tank, AST = aboveground ²TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Appendix B

Basic American Foods Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use $x\ 0.375$)

Final Susceptibility Scoring:

- 0 5 Low Susceptibility
- 6 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name: BASIC AMERICAN FOODS WELL #3

Public Water System Number 6060002 7/23/02 11:51:15 AM

Public water System	m number 6060002		//23/02 11.	51·15 AM	
. System Construction		SCORE			
Drill Date	1/1/62				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	1998			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	4			
. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	6			
		IOC	VOC	SOC	Microbial
Potential Contaminant / Land Use - ZONE 1A		Score	Score	Score	Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
	ial Contaminant Source/Land Use Score - Zone 1A	4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	20	22	23	13
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	21	22	12	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potentia	l Contaminant Source / Land Use Score - Zone 1B	16	16	18	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
	Contaminant Source / Land Use Score - Zone II	5	5	5	0
Potential					
Potential Contaminant / Land Use - ZONE III					
	YES	1	 1	1	
Potential Contaminant / Land Use - ZONE III		1 1	1 1	1 1	
Potential Contaminant / Land Use - ZONE III Contaminant Source Present	YES				

Total Potential Contaminant Source / Land Use Score - Zone III	3	3	3	0	
Cumulative Potential Contaminant / Land Use Score	28	 26 	30	14	_
4. Final Susceptibility Source Score	16	15	16	15	-
5. Final Well Ranking	 High	 High	 High	High	_

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System Construction		SCORE			
Drill Date	unknown				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	1998			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO				
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	5			
Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	6			
Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbi Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	 2	 2	 2
Farm chemical use high	YES	2	0	2	2
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
	al Contaminant Source/Land Use Score - Zone 1A	4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	20	22	23	13
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	21	22	12	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Land use Zone 1B					
Total Potential	. Contaminant Source / Land Use Score - Zone 1B	16	16	18	12
Total Potential	. Contaminant Source / Land Use Score - Zone 1B	16	16	18	12
Total Potential Potential Contaminant / Land Use - ZONE II Contaminant Sources Present	Contaminant Source / Land Use Score - Zone 1B	2	16	18	12
Total Potential Potential Potential Contaminant / Land Use - ZONE II	. Contaminant Source / Land Use Score - Zone 1B		·		12
Total Potential Potential Contaminant / Land Use - ZONE II Contaminant Sources Present	Contaminant Source / Land Use Score - Zone 1B	2	2	2	12
Total Potential Potential Contaminant / Land Use - ZONE II Contaminant Sources Present Sources of Class II or III leacheable contaminants or Land Use Zone II	Contaminant Source / Land Use Score - Zone 1B YES YES YES Greater Than 50% Irrigated Agricultural Land	2	2	2 1	12
Total Potential Potential Contaminant / Land Use - ZONE II Contaminant Sources Present Sources of Class II or III leacheable contaminants or Land Use Zone II Potential Potential Contaminant / Land Use - ZONE III	Contaminant Source / Land Use Score - Zone 1B YES YES YES Greater Than 50% Irrigated Agricultural Land	2 1 2	2 1 2	2 1 2	
Total Potential Potential Contaminant / Land Use - ZONE II Contaminant Sources Present Sources of Class II or III leacheable contaminants or Land Use Zone II Potential	Contaminant Source / Land Use Score - Zone 1B YES YES YES Greater Than 50% Irrigated Agricultural Land	2 1 2	2 1 2	2 1 2	
Total Potential Potential Contaminant / Land Use - ZONE II Contaminant Sources Present Sources of Class II or III leacheable contaminants or Land Use Zone II Potential Potential Contaminant / Land Use - ZONE III	YES YES Greater Than 50% Irrigated Agricultural Land Contaminant Source / Land Use Score - Zone II	2 1 2 5	2 1 2 5	2 1 2 5	

	Total Potential Contaminant Source / Land Use Score - Zone III	3	3	3	0	
Cumulative Potential Contaminant / Land Use Score			26	30	14	_
4. Final Susceptibility Source Score		16	 15	16	15	-
5. Final Well Ranking		High	 High	High	High	-